[illegible], [illegible]

[illegible] and prospects of the [illegible] of some infectious diseases and the [illegible] of the general incidence of infections in the U.S.S.R. [illegible] AMN SSSR 19 no.8:3-9 '64. (MIRA 18:7)

1. Institut [illegible] AMN SSSR, Moskva.

L 23469-66 EWT(1)/T JK

ACC NR: AP6014017 SOURCE CODE: UR/0016/65/000/009/0003/0006

AUTHOR: Timakov, V. D.; Skavronskaya, A. G.; Pokrovskiy, V. N.--Pokrovsky, V. N. 39

ORG: Institute of Epidemiology and Microbiology imeni Gamaleya, AMN SSSR 38

TITLE: Mechanism of the mutagenic action of 5-bromouracil B

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 9, 1965, 3-6

TOPIC TAGS: DNA, RNA, streptomycin, biologic mutation, chromatography, brominated organic compound

ABSTRACT: The nucleotide composition of DNA from streptomycin - resistant mutants formed from an S. typhimurium No 70 culture under the action of 5-bromouracil was studied (cf. V. N. Pokrovskiy, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii Vol 41, No 1, 92, 1964; Vol 41, No 7, 51, 1964). Chromatographic separation indicated that the nucleotide composition of DNA of the mutants was the same as that of DNA of the initial culture: the same bases were present, while 5-bromouracil was absent. This indicated that the mutation mechanism involved changes in the structure of DNA rather than in composition. The changes in structure presumably consisted of replacement of one nucleotide pair by another due to faulty coupling of guanine with 5-bromouracil, as suggested by E. Friz [Fries]. The guanine-cutosine paid was then replaced by the adenine-thymine pair, or

Z

UDC: 576.8.095.5:547.854.4

Card 1/2

L 23469-66

ACC NR: AP6014017

vice versa. It was shown in former work by Pokrovskiy that 5-bromouracil, in exerting its mutagenic activity, was included into the composition of DNA of bacterial cells of the initial culture undergoing mutation, but not into that of RNA of the cells. Orig. art. has: 1 figure and 1 table. [JPRS]

SUB CODE: 06, 07 / SUBM DATE: 05Aug64 / ORIG REF: 004 / OTH REF: 004

Card 2/2 *JO*

TIMAKOV, V.D.; SKAVRONSKAYA, A.G.; POKROVSKIY, V.N.

Mechanism of the mutagenic action of 5-bromuracil. Zhur.mikrobiol., epid. i immun. 42 no.9:3-6 S '65.

(MIRA 18:12)

1. Institut epidemiologii i mikrobiologii imeni Gamalei AMN SSSR. Submitted August 5, 1964.

TIMAKOV, V.D.; KAGAN, G. Ya.

Pathogenicity of L-form bacteria and of the family Mycoplasmataceae and their role in infectious pathology. Report No. 2: Significance of the micro-organism of the family Mycoplas,ataceae (PPLO) in infectious pathology. Zhur. mikrobiol., epid. i immun. 43 no. 1: 11-17 Ja '66 (MIRA 19:1)

1. Institut epidemiologii i mikrobiologii imeni Gamalei AMN SSSR. Submitted July 28, 1964.

TIMAKOV, V.D.; KAGAN, G.Ya.

Results and perspectives of the study on L-form bacteria and the family Mycoplasmataceae. Vest. AMN SSSR 20 no.8:3-12 '65.
(MIRA 18:9)

1. Institut epidemiologii i mikrobiologii imeni N.F.Gamalei AMN SSSR, Moskva.

TIMAKOV, V.D.

Forthcoming 14th All-Union Congress of Epidemiologists, Microbiologists and Infectious Disease Specialists. Zhur. mikrobiol., epid. i immun. 41 no.4:3-8 Ap '64. (MIRA 18:4)

KAMENETSKIY, L.M., inzh.; TIMAKOV, V.V., inzh.

Automatic feed of carding machines. Mekh. i avtom.proizv. 19 no.2:13-15 F '65. (MIRA 18:3)

PALENICHKO, Z.G.; TIMAKOVA, M.N.

Hydrobiological characteristics of Kuz Bay in the Pomorskiy coastal region of the White Sea. Mat. po kompl.izuch.Bel.mor. no.1:381-390 '57. (MLRA 10:8)

1. Bilmorskaya biologicheskaya stantsiya Instituta biologii Karel'skogo filiala AN SSSR.
(Kuz Bay--Marine biology)

USSR / General Biology. General Hydrobiology. B-6

Abs Jour : Ref Zhur - Biol., No 12, 1958, No 52476

Author : Palenichko, Z. G.; Timakova, M. N.
Inst : AS USSR
Title : Hydrobiological Characteristics of the Kuz Bay on the White Sea Coast.

Orig Pub : Materialy po kompleksn. izuch. Belogo morya. I. M.-L. AN SSSR, 1957, 381-390.

Abstract : A short description of bay hydrobiology; characteristics of the varietal composition and distribution of zooplankton, phyto- and zoobenthos; qualitative data on the feeding of polar and river flounder, navaga, arctic stickleback, and whitefish, and also a short survey of the fish industry and of sea bottom flora. -- N. I. Kashkin.

Card 1/1

TIMAKOVA, N.N.

Nutrition and food relationships of navaga and smelt in Onega Bay of the White Sea. Mat. po kompl.izuch.Bel.mor. no.1:185-221 '57. (MLRA 10:8)

1.Belomorskaya biologicheskaya stantsiya Instituta biologii Karel'skogo filiala AN SSSR.
(Onega Bay--Codfish) (Onega Bay--Smelts) (Fishes--Food)

TIMAKOVA, M.N.

"Food and Feeding Relationships Between Dorse and Smelt in the Onezhskiy Bay of the White Sea." Cand Biol Sci, Karelo-Finnish State U; Inst of Biology of the Karelo-Finnish Affiliate, Acad Sci USSR, Petrozavodsk, 1953. (RZhBiol, No 1, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (13) SO: Sum. 598, 29 Jul 55

NIKITIN, V.D.; YAKIMETS, Ye.M.; TIMAKOVA, N.A.; RAL'K., V.A.; SHABASHOVA, N.V.; TRIBUNSKIY, V.V.

Preparing chelate compounds of ethlenediaminetetraacetic acid with the cations of certain metals and methods of their analysis. Trudy Ural.politekh.inst. no.130:94-103 '63.

(MIRA 17:10)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755710007-8"

TIMAKOVA, N.V.

Mechanism of the primary stages of the interaction of phage X174 with Escherichia coli C. Zhur.mikrobiol., epid. i immun. 42 no.12:97-101 D '65.

(MIRA 19:1)

1. Institut epidemiologii i mikrobiologii imeni Gamalei AMN SSSR.

USSR / Human and Animal Morphology (Normal and Pathological). Digestive System. S-3

Abs Jour: Ref Zhur-Biol., No 17, 1958, 79054.

Author : Timakova, ~~Z. F.~~
Inst : Not given.
Title : Some Experimental Observations on the Exsection of the Mesentery at Different Levels from the Region of the Intestine.

Orig Pub: Sb. nauchn. rabot. Sverdl. otd. Vses. o-va anatomov, gistologov i embriologov, 1957, vyp. 1, 66-69.

Abstract: During resection of the mesentery for a length of 10 cm in the immediate area of the intestine, dogs perished from gangrene of the intestinal wall or from peritonitis. Removal of the mesentery of the same length but closer to the root

Card 1/2

USSR / Human and Animal Morphology (Normal and Pathological. Digestive System. S-3

Abs Jour: Ref Zhur-Biol., No 17, 1958, 79054.

Abstract: by 1.5 cm and more did not lead to the impairment of blood circulation. During resection of the mesentery by withdrawing 10.5 cm from the region of the intestine, the dogs lived with 25 cm of the intestine excluded from nourishment. Thus, the closer the mesentery is removed from the intestine, the greater the danger of necrosis.

Card 2/2

TIMAN, A.; SINEV, D., starshiy inzh. po ratsionalizatsii i novoy tekhnike

New drilling rig. Neftianik 7 no.1:16 Ja. '62. (MIRA 15:2)

1. Glavnyy inzh. Sterlitamakskoy geologopoiskovoy kontory (for Timan).

(Oil well drilling rigs)

TIMAN, A.F.

Nonlinear functional equation in a class of functions convex on the semiaxis. Izv. AN SSSR. Ser. mat. 28 no.3:515-526 My-Je '64. (MIRA 17:6)

TIMAN, A.F.

Observations on trigonometric polynomials and on the Fourier-Stieltjes' series. Usp.mat.nauk 12 no.2(74):175-183 Mr-Ap '57. (Polynomials) (Fourier's series)

TIMAN, B

USSR

62

6702 AEC-tr-2201
CONCENTRATIONS OF IONS IN A THERMALLY IONIZED GAS AS A FUNCTION OF PRESSURE. B. Timan. Translated from Doklady Akad. Nauk S.S.S.R. 97, 1013-14 (1954). 3p. Available from Associated Technical Services (Trans. 33G6R), East Orange, N. J.

An investigation is made of the influence of gaseous ion interactions, in various degrees of ionization, on their equilibrium concentrations. Equations are derived which give the ion concentration as a function of gas pressure. (B.J.H.)

TIMAN A.B.

TIMAN, A.B.

Using the "Ufimets" rig for drilling exploratory wells in southern Bashkiria. Neftianik 2 no.8:3-4 Ag '57. (MIRA 10:10)

1. Glavnyy inzhener Sterlitamakskoy geologo-poiskovoy kontory tresta Bashvostoknefterazvedka.
(Bashkiria--Petroleum geology--Equipment and supplies)

TIMAN, A. F.

Transactions of the Third All-union Mathematical Congress (Cont.) Moscow, Jun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo AN SSSR, Moscow, 1956, 237 pp.
There are 4 references, 2 of which are English, 1 is USSR, and 1 French.

Temlyakov, A. A. (Moscow). Integral Representation of Functions of Two Complex Variables. 105

Timan, A. F. (Dnepropetrovsk). On a Linear Approximation Processes of Periodic Function by Trigonometric Polynomials 105-106

Timan, A. F. (Dnepropetrovsk). On Some Problems of the Constructive Theory of Functions Defined in the Finite Interval of Real Axis Section. 106

Mention is made of Nikol'skiy, S. M. and Chebyshev, P. L. 106

Trokhimchuk, Yu. Yu. (Novosibirsk). On N. N. Luzin Problems in the Theory of Functions of a Complex Variable. 106

Tumarkin, G. Ts. (Moscow). On Certain Boundary Properties of Analytic Function Sequences. 106-107

Card 33/80

TIMAN, A.F.

Order of growth of ε-entropy of spaces of real continuous functionals defined on a connected compact. Usp. mat.nauk 19 no. 1:173-177 Ja-F '64. (MIRA 17:6)

GOPENGAUZ, I.Ye.; TIMAN, A.F.

The modulus of continuity of periodic functions with a given modulus of smoothness. Usp.mat.nauk 12 no.3:291-294 My-Je '57. (MIRA 10:10)

(Functions, Periodic)

TIMAN, A.F.

38-4-9/10

AUTHOR: TIMAN, A.F.

TITLE: Addition to A.V.Yefimov's Paper "Estimation of the Modulus of Continuity of the Functions of Class $\tilde{H}_2^1$ " (Dobavleniye k rabote A.V.Yefimova "Otsenka modulya nepreryvnosti funktsii klassa $\tilde{H}_2^1$ ").

PERIODICAL: Izvestiya Akad.Nauk,Ser.Mat.,1957,Vol.21,Nr 4, pp.595-598(USSR)

ABSTRACT: Theorem: If the function $f(x)$ defined on the whole real axis satisfies for arbitrary x_1 and x_2 the condition

$$(1) \qquad \left|f(x_1) - 2f\left(\frac{x_1+x_2}{2}\right) + f(x_2)\right| \leqslant |x_1 - x_2|$$

then for arbitrary $h > 0$ there holds the inequality

$$\omega_x(f;h) = \sup_{|t|\leqslant h} |f(x)-f(x+t)| \leqslant \frac{1}{\ln(\sqrt{2}+1)} h|\ln h| + C\Big[1+|f(1)-f(0)|(1+|x|) + |x \ln |x||\Big] h ,$$

where C is an absolute constant. Here the coefficient $\frac{1}{\ln(\sqrt{2}+1)}$ can be decreased neither for $h \to 0$ nor for $h \to \infty$. On $(-\infty,+\infty)$ there exists a function $f(x)$ for which this inequality for $h \to 0$ and $h \to \infty$ transforms into an asymp-

CARD 1/2

Addition to A.V. Yefimov's Paper "Estimation of the Modulus of Continuity of the Functions of Class $H_2^!$ " 38-4-9/10

totic equation.
Theorem: If the function $f(x)$ defined on $[a,\infty]$ satisfies the condition (1) for arbitrary x_1 and x_2, then for arbitrary $h>0$ there holds the inequality

$$\omega_x(f;h) \leqslant \frac{1}{\ln 2} h|\ln h| + C\left[1+|f(a+1)-f(a)|(1+|x|)+|x \ln|x||\right] h$$

with the absolute constant C. The coefficient $\frac{1}{\ln 2}$ cannot be decreased for $h \to 0$ and $h \to \infty$ too. On $[a,\infty]$ there exists a function $f(x)$ for which for $x \geqslant a$, $h \to \infty$ and $h \to 0$, $x = a$ this inequality transforms into an asymptotic equation.

PRESENTED: By M.A. Lavrent'yev, Academician

SUBMITTED: October 15, 1956

AVAILABLE: Library of Congress

CARD 2/2

continues au moyen des polynô[illegible] [Izvestia Akad. Nauk
Bull. Acad. Sci. URSS. Sér. Math.
SSSR] 11, 263–282 (1947). (Russian. French sum-

...sberg, M. M. On the ...

More generally it is shown that the norm of the operator

Source: Mathematical Reviews

Source: Mathematical Reviews, Vol 12 No. 5

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755710007-8"

A E

[illegible] (Doklady Akad. Nauk [illegible]

[illegible]

The condition [illegible]

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TIMAN, A.F.

[illegible]

[illegible] then there is a

TTMAN, A.F.

Т[illegible]МАН А.Ф.

USSR/Mathematics - Approximations, Fourier Series 21 Jun 52

"Linear Methods of Approximating the Periodic Functions by Trigonometric Polynomials," A. F. Timan

"Dok Ak Nauk SSSR" Vol LXXXIV, No 6, pp 1147-1150

Any triangular matrix of numbers determines a certain linear method of approximation for deriving, in correspondence with each integrable function of period 2π, a sequence of trigonometrical polynomials. One of the most important problems in the theory of approximation is the problem of investigating the approx properties of methods of

223T85

this type. (Reference: D. Jackson, "The Theory of Approximation," New York, 1930.) Submitted by Acad A. M. Kolmogorov 23 Apr 52.

223T85

TIMAN, A. F.

TIMAN, A. F.

Mathematical Reviews
Vol. 14 No. 9
October 1953
Analysis

1/2

Timan, A. F. Approximation properties of linear methods of summation of Fourier series. Izvestiya Akad. Nauk SSSR. Ser. Mat. 17, 99–134 (1953). (Russian)

The first part of the paper gives the proof of a theorem announced by the author in a previous note [Doklady Akad. Nauk SSSR (N.S.) 81, 509–511 (1951); these Rev. 13, 137]. The second part of the paper is devoted to the exploitation of the following idea. Let $\lambda_k^{(n)}$ ($k=0, 1, \ldots, n$; $n=0, 1, \ldots$) be a triangular matrix satisfying $|\lambda_k^{(n)}|\leq 1$, $\lambda_0^{(n)}=1$. With any Fourier series $\frac{1}{2}a_0+\sum a_k \cos kx+b_k \sin kx$ of a continuous function f we associate the polynomials

$$U_n(f; x; \lambda)=\frac{a_0}{2}\sum_{k=1}^{n}\lambda_k^{(n)}(a_k \cos kx+b_k \sin kx),$$

and for a class $\mathfrak{M}$ of functions f introduce the expression

$$\mathcal{E}_n(\mathfrak{M}, \lambda)=\sup_{x, f\in\mathfrak{M}}|f(x)-U_n(f; x; \lambda)|.$$

It is a well-known fact that the rapidity with which $\lambda_k^{(n)}$ tends to 1 for $k\to\infty$ and each n is reflected in the rapidity with which $\mathcal{E}_n$ tends to 0 as $n\to\infty$. The author investigates this connection when $\mathfrak{M}$ is the class $W^{(r)}H_\omega$ of functions having an rth derivative whose modulus of continuity does not exceed the given function $\omega(\delta)$, and class $\overline{W^{(r)}H_\omega}$ of functions conjugate to the functions in $W^{(r)}H_\omega$. He shows that both $\mathcal{E}_n(W^{(r)}H_\omega, \lambda)$ and $\mathcal{E}_n(\overline{W^{(r)}H_\omega}, \lambda)$ are not less than

(OVER)

Timan, A. F.

$$\pi^{-1}\int_0^{\pi/2}\omega(2t/n)\sin t\,dt\left|\sum_{k=1}^{n}\frac{1-\lambda_k^{(n)}}{k^r(n-k+1)}-\frac{\log n}{n^r}\right|$$

$$+O\left\{n^{-1}\omega(n^{-1})\sum_{k=1}^{n}\frac{1-\lambda_k^{(n)}}{k^r}\right\}+O(n^{-r}\omega(n^{-1}))$$

where the factor $O(1)$ on the right denotes quantities uniformly bounded for all matrices $\{\lambda_k^{(n)}\}$ considered. If in addition $\omega(t)$ is concave, the inequality holds even when the right side is multiplied by 2 and this is the best possible estimate. In the case when $\omega(t)=t^\alpha$, $0<\alpha<1$, the author obtains estimates from above for $\mathcal{E}_n(W^{(r)}H_\omega,\lambda)$ and $\mathcal{E}_n(\overline{W^{(r)}H_\omega},\lambda)$. In the special case when $r=0$, $\omega(t)=t^\alpha$, $0<\alpha<1$, and when each row of the matrix $\lambda_k^{(n)}$ is a decreasing and concave sequence, the last two expressions are

$$2^{\alpha+1}\pi^{-1}n^{-\alpha}\int_0^{1\pi}t^\alpha\sin t\,dt\sum_{k=1}^{n}\frac{\lambda_k^{(n)}}{n-k+1}+O(n^{-\alpha}).$$

A. Zygmund (Chicago, Ill.).

TIMAN, A. F.

4

Mathematical Reviews
Vol. 14 No. 10
Nov. 1953
Analysis

7-13-54
LL

Timan, A. F. On interference phenomena in the behavior of entire functions of finite degree. Doklady Akad. Nauk SSSR (N.S.) 89, 17–20 (1953). (Russian)

Let $B_\sigma^{(q)}$ denote the class of entire functions which are of exponential type σ and $o(|x|^q)$ on the real axis, with $\{f(k\pi/\sigma)\}$ bounded; B_σ is the subclass whose members are bounded on the real axis. S. Bernstein [Izvestiya Akad. Nauk SSSR. Ser. Mat. 12, 421–444 (1948); these Rev. 10, 363] established the "interference theorem" that if $f(z)$ belongs to $B_\sigma^{(1)}$, then $f(z+\frac{1}{2}\pi/\sigma)+f(z-\frac{1}{2}\pi/\sigma)$ belongs to B_σ (with an explicit bound). The author generalizes this by obtaining a condition on the function $\rho(x)$, of bounded variation, satisfying $\int_{-\infty}^{\infty} e^{\tau|x|}|d\rho(x)|<\infty$ (some $\tau>\sigma$), which is necessary and sufficient for the function $\int_{-\infty}^{\infty} f(z+t)d\rho(t)$ to belong to B_σ when $f(z)$ belongs to $B_\sigma^{(q)}$. The condition is that for $k=0, 1, \cdots, [q-2]$, the integrals $\int_{-\infty}^{\infty} t^k(\sin, \cos)\sigma t d\rho(t)$ should be zero. [Since a function of $B_\sigma^{(q)}$, $q>1$, is necessarily of the form $g(z)+P(z)\sin\sigma z$, with g in $B_\sigma^{(1)}$ and P a polynomial, the case $q>1$ is readily deduced from the case $q=1$.] In particular, $f(z+\lambda)+f(z-\lambda)$ has the property in question ($q=1$) only when $\lambda=\frac{1}{2}m\pi/\sigma$; the author determines the asymptotic behavior (as $m\to\infty$) of the bound in this case.

R. P. Boas, Jr. (Evanston, Ill.).

TIMAN, A. F.

USSR/Mathematics - Approximation

"Approximation of Functionswith Given Modulus of Continuity by Chebyshev Sums," I. M. Ganzburg, Dnepropetrovsk State Univ

DAN SSSR, Vol 91, No 6, pp 1253-1256

States that it is of considerable interest to det the asymptotic behavior of the upper bound of the deviations of functions $F(x)$ from their Chebyshev sum $S_n(f, x)$ as extended to the class H_w of given functions $f(x)$ $(-1<x<1)$ for which the inequality $/f(x')-f(x'')/= w(x'-x''/)$ holds; here $w(t)$ is a convex-upward function representing the modulus of continuity. That is, the author considers the asymptotic evaluation of the quantity $E_n(H_w,x) = \sup / f(x) - s_n(f,x)$ for f in h_w and for any Lipschitz condition -a $(0<a \leq 1)$. Demonstrates a theorem that gives for each x in the interval $(-1,1)$ the asymptotic behavior of E_n uniformaly in $(-1,1)$. Notes that this problem was solved by S. M. Nikol'skiy (Iz AN SSSR, Ser Matem. 10, 295, 1946) for Lipschitz condition -1 and by A. F. Timan (DAN 77, No 6, 969, 1951) for Lipschitz condition -a $(0<a<1)$. Acknowledges advice of Professors S. M. Nikol'skiy and A. F. Timan. Presented by Acad A. N. Kolmogorov 27 June 53.

275T75

TIMAN, A.F.

62 **Timan, A. F.** On linear processes of approximation by algebraic polynomials, Lebesgue functions, and some applications to Fourier series. Dokl. Akad. Nauk SSSR (N.S.) 101, 221–224 (1955). (Russian) 1-F/W

Let $\sum_0^\infty c_k T_k(x)$ be the Fourier development of a function $f(x)$, $-1 \leqq x \leqq 1$, into a series of Chebyshev polynomials $\cos k \arccos x$, normalized with respect to the weight function $(1-x^2)^{-1/2}$ $(-1<x<1)$. Given a triangular matrix of number $l_k^{(n)}$ $(k=0, 1, 2, \cdots, n+1; l_0^{(n)}=1, l_{n+1}^{(n)}=0)$, we consider linear means $U_n(f, x, l)=\sum_{k=0}^n l_k^{(n)} c_k T_k(x)$ and ask about the system $l_k^{(n)}$ such that $U_n(f, x, l) \to f(x)$, uniformly in x. Write

$$M_n(x)=\sup_{|f(x)|\leq 1} |U_n(f, x, l)|,$$

where the upper bound is for all measurable f satisfying $|f| \leqq 1$ on $(-1, 1)$. Then (1) if all rows of the matrix $l_k^{(n)}$ are of uniformly bounded variation (that is if $\sum_{k=0}^n |\Delta l_k^{(n)}|=O(1)$) we have

(†) $M_n(x) \geqq 4\pi^{-2}|L_n(1)-\{1-|T_n(|x|)|\}L_n(x)+O(1)$,

where $L_n(x)=\sum_{k=1}^n k^{-1} l_{n-k}^{(n)} T_k(x)$, and the $O(1)$ on the right is uniform in $-1 \leqq x \leqq 1$ and $n=1, 2, \cdots$. (2) If $l_k^{(n)}=O(1)$ and each row of the matrix $l_k^{(n)}$ is convex or concave, then the sign '$\leqq$' in (†) can be replaced by '='.

A. Zygmund (Chicago, Ill.).

Dnepropetrovsk State U.

TIMAN, A. F.

SUBJECT USSR/MATHEMATICS/Fourier series CARD 1/2 PG - 630
AUTHOR POGODIČEVA N.A., TIMAN A.F.
TITLE On a relation in the theory of summation of the interpolation polynomials and the Fourier series.
PERIODICAL Doklady Akad.Nauk 111, 542-543 (1956)
reviewed 3/1957

Let C be the class of all 2π-periodic functions $f(x)$, let $S_n(f;x) = \frac{a_o}{2} + \sum_{k=1}^{n} a_k \cos k x + b_k \sin k x$ be the n-th partial sum of the Fourier series for $f(x)$ and $\tilde{S}_n^{(n)}(f,x) = \frac{a_o^{(n)}}{2} + \sum_{k=1}^{n} (a_k^{(n)} \cos k x + b_k^{(n)} \sin k x)$ a trogonometric polynomial of n-th order which interpolates $f(x)$ in the system of knots $x_\nu^{(n)} = \frac{2\nu\pi}{2n+1}$ $(\nu = 0,1,2,\ldots 2n)$. Every triangular matrix of the numbers $\lambda_k^{(n)}$ $(k=0,1,2,\ldots,n+1;\ \lambda_o^{(n)} = 1;\ \lambda_{n+1}^{(n)} = 0)$ determines two interpolation processes:

(1) $$u_n(f;x;\lambda) = \frac{a_o}{2} + \sum_{k=1}^{n} \lambda_k^{(n)} (a_k \cos k x + b_k \sin k x)$$

and

(2) $$\tilde{u}_n(f;x;\lambda) = \frac{a_o^{(n)}}{2} + \sum_{k=1}^{n} \lambda_k^{(n)} (a_k^{(n)} \cos k x + b_k^{(n)} \sin k x).$$

Doklady Akad.Nauk 111, 542-543 (1956) CARD 2/2 PG - 630

As is well-known there holds the inequation

$$A \sup_x L_n(x) \leq L_n \leq B \sup_x L_n(x),$$

where B and A are certain positive constants being independent of $\lambda_k^{(n)}$ and

(3) $$L_n = \sup_{|f(x)| \leq 1} |u_n(f;x;\lambda)| \; ; \quad L_n(x) = \sup_{|f(x)| \leq 1} |\tilde{u}_n(f,x,\lambda)| \; .$$

This inequation is precised by the authors in the following manner:
Theorem: If $|\lambda_k^{(n)}| \leq M$ and for every fixed n the values $\lambda_k^{(n)}$ ($k=0,1,\ldots,n+1$; $\lambda_0^{(n)} = 1$, $\lambda_{n+1}^{(n)} = 0$) form a convex or concave system of numbers, then for $n \to \infty$ there always holds the relation

$$L_n(x) = \frac{\pi}{2} \left| \sin \frac{2n+1}{2} x \right| L_n + O(1),$$

where $O(1)$ is uniformly bounded with respect to x and n by a constant depending only on M.

INSTITUTION: University, Dnjepropetrovsk.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755710007-8"

TIMAN A.F.

SUBJECT: USSR/MATHEMATICS/Theory of approximations CARD 1/1 PG-638
AUTHOR: TIMAN A.F., TUČINSKI L.I.
TITLE: Approximation by aid of algebraic polynomials, of differentiable functions which are given on a finite interval.
PERIODICAL: Doklady Akad.Nauk 111, 771-772 (1956)
reviewed 3/1957

Let the functions $f(x)$ be defined on $[-1,+1]$ and possess there the r-th derivative $f^{(r)}(x)$ $(r \geqslant 0)$ which satisfies the Lipschitz condition $\left|f^{(r)}(x_1)-f^{(r)}(x_2)\right| \leq M\left|x_1-x_2\right|^{\alpha}$ $(0 \leq \alpha < 1)$. Let $\hat{T}_0(x) = \sqrt{\frac{1}{\pi}}$, $\hat{T}_k(x) = \sqrt{\frac{2}{\pi}}\cos k \arccos x$, $k=1,2,\ldots$ and $c_k = \int_{-1}^{+1} \frac{f(t)\hat{T}_k(t)}{\sqrt{1-t^2}}\,dt$. Let $S_n(f,x) = \sum_{k=0}^{n} c_k \hat{T}_k(x)$ be the partial sum of the corresponding Fourier-Čebyšev series. The authors prove the following theorem: For $n \to \infty$ uniformly with respect to all $x \in [-1,+1]$ the asymptotic equation

$$\sup_{\text{over all } f} \left|f(x)-S_n(f,x)\right| = \frac{2^{\alpha+1}M}{\pi^2}\,\frac{\ln n}{n^{r+\alpha}}\left(\sqrt{1-x^2}\right)^{r+\alpha}\int_0^{\frac{\pi}{2}} t^{\alpha}\sin t\,dt + O\left(\frac{1}{n^{r+\alpha}}\right) \quad (r+\alpha > 0)$$

is valid.

TIMAN, A.F.

SUBJECT USSR/MATHEMATICS/Topology CARD 1/1 PG - 676
AUTHOR TIMAN A.F.
TITLE Generalization of a theorem of Stone.
PERIODICAL Doklady Akad.Nauk 111, 955-958 (1956)
reviewed 4/1957

Let G be a regular topological space, f(x) a function defined on G. Let $G_a(f)$ and $G^a(f)$ be the subspaces of G, for which $f(x) \geq a$ and $f(x) \leq a$ respectively. Let further $a_0 = a_0(f) \leq \infty$ be the lower bound of all numbers a for which $G_a(f)$ is bicompact.

Then the following generalization of the theorem of Stone (Trans.Amer.Math. Soc. 41, 375 (1937)) is valid: Let G be a regular topological space and on it let $\mathfrak{M}$ be the totality of all bounded and continuous real functions f(x) with the property that for every real number a (with at most one exception) one of the subspaces $G_a(f)$, $G^a(f)$ is bicompact. Let D be a subset of $\mathfrak{M}$ which with respect to the usual addition and multiplication of functions forms an algebraic ring which contains all constants. If to each two points $x_1 \neq x_2$ in D there exists a function f(x), where $f(x_1) \neq f(x_2) \neq a_0(f)$, then in the sense of the uniform convergence on G, D is everywhere dense in $\mathfrak{M}$.

INSTITUTION: University, Dnjepropetrovsk.

SUBJECT USSR/MATHEMATICS/Fourier series CARD 1/2 PG - 831
AUTHOR TIMAN A.F.
TITLE Some remarks on trigonometric polynomials and Fourier-Stieltje's series.
PERIODICAL Uspechi mat.Nauk 12, 2, 175-183 (1957)
reviewed 6/1957

A paper of Steckin (Uspechi mat.Nauk 10, 1, 159-165 (1955)) induces the author to publish some completing and improving results.
Theorem: For every trigonometric polynomial

$$(1) \qquad K_n(t) = \frac{a_o}{2} + \sum_{k=1}^{n} a_k \cos kt, \qquad a_k \text{ arbitrary complex,}$$

it holds the exact inequation

$$(2) \qquad \int_0^{\pi} |K_n(t)|\, dt \geqslant \frac{2}{\pi} \left| \sum_{\nu=0}^{\infty} \frac{1}{2\nu+1} \sum_{k=(2n+1)\nu}^{(2n+1)(\nu+1)-1} \frac{a_{|(2n+1)\nu+n-k|}}{k+\frac{1}{2}} \right| .$$

For every n=0,1,2,... there exists a polynomial for which the inequation changes to an equation.

Uspechi mat.Nauk 12, 2, 175-183 (1957) CARD 2/2 PG - 831

Theorem: For every polynomial (1) it holds the inequation

$$\int_0^{\pi} |K_n(t)|\, dt \geqslant \frac{2}{\pi} \left| \sum_{\nu=0}^{\infty} \frac{1}{2\nu+1} + \sum_{k=m+1}^{(\nu+1)m-1} \frac{a_{|(2\ +1)m-2k|}}{k} \right|,$$

where $m = 2\left[\frac{n+2}{2}\right]$ or $m = 2\left[\frac{n+1}{2}\right]+1$ and the constant $\frac{2}{\pi}$ cannot be improved for all $n=0,1,2,\ldots$.

Theorem: If both $\sum_{k=\infty}^{+\infty} c_k e^{ikx}$, $c_k = \frac{1}{2}(a_k - ib_k)$ and

$$\frac{1}{2} a_0 \lambda_0 + \sum_{k=1}^{\infty} \lambda_k (a_k \cos kx + b_k \sin kx)$$

are Fourier series of arbitrary bounded measurable functions (or continuous functions, or integrable functions), then the series $\sum_{k=1}^{\infty} \frac{\lambda_{|k-n|} - \lambda_{k+n}}{k}$ converges uniformly with respect to $n=0,1,2,3,\ldots$.

TIMAN, A. F.

20-5-13/

AUTHOR TIMAN A.F., TIMAN M.F.

TITLE On the Dependences Between the Moduli of Smoothness of the Functions Assumed On the Entire Real Axis. (O zavisimosti mezhdu modulyami gladkosti funktsiy, zadannykh na vsey veshchestvennoy osi, -Russian)

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 5, pp 995-997 (U.S.S.R.)
Received 6/1957 Reviewed 7/1957

ABSTRACT Be it that $1 \leq p \leq \infty$ and $f(x)$ is an arbitrarily assumed function in the interval $(-\infty, \infty)$, for which $\|f\|_{L_p} = (\int_{-\infty}^{\infty} |f(x)|^p dx)^{1/p} < \infty$ applies. The authors investigate the function $w_k(f,t)_{L_p} = \sup_{|h| \leq t} \left[\int_{-\infty}^{\infty} \left|\sum_{\nu=0}^{k} (-1)^{k-\nu} \binom{k}{\nu} f(x+\nu h)\right|^p dx\right]^{1/p}$, for any natural $k \geq 1$, which is defined upon the semiaxis $t \geq 0$ and within the corresponding metric represented the modulus of smoothness of the order k for $f(x)$. At $k < \nu$, $w_\nu(f;t)_{L_p} \leq 2^{\nu-k} w_k(f;t)_{L_p}$ APPLIES! EXAmples of functions may be given for which this inequation (which evaluate; the modula of smoothness in an upward direction by the moduli of smoothness of lower order) is changed into an equation with respect to the order (about $t \to 0$). The authors next give a theorem by which the order of the moduli of smoothness of the function may be evaluated in an upward direction by their moduli of smoothness of higher orders.

Card 1/2

Theorem: In the case $1 \leq k < \nu$ at $0 < t \leq 1/2$,

On the Dependences Between the Moduli of Smoothness of the Functions Assumed On the Entire Real Axis. 20-5-13/67

$w_k(f;t)_{L_p} \leqslant C_{v,k} t^k \int_t^1 \int_{t_1}^2 \ldots \int_{t_{v-k-1}}^{v-k} (w_v(f;t_{v-k})_{L_p}/t_{v-k}^v) dt_1 \ldots dt_{v-k}$ applies.

Here $C_{v,k}$ is a constant which does not depend upon the function f. The following inequation always applies at $k \geqslant 1$

$w_k(f;t)_{L_p} \leqslant C_k t^k \int_k^1 (w_{k+1}(f;u)_{L_p}/u^{k+1}) du$ two corollaries resulting from this theorem are given. In conclusion two lemmata are written down, which may by used as a proof of the theorem.

(No ill...)

ASSOCIATION State University Dnepropetrovsk

PRESENTED BY KOLMOGOROV A.N., Member of the Academy

SUBMITTED 24.9.1956

AVAILABLE Library of Congress

Card 2/2

TIMAN, A.F. [Timan, O.F.]

Mutual deviation of classes of real functions, defined on arbitrary compacts, with given majorants of the continuity modulus. Dop. AN URSR no.11:1416-1418 '63. (MIRA 17:12)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut.

[illegible]

[illegible] inequality for the continuity modulus of a class of [illegible] smooth functions. Uch. zap. Kaz. un. 124 no.6:[illegible]96-298 [illegible]. (MIRA 18:9)

L 3961-66 EWT(d)/T IJP(c) SOURCE CODE: UR/0042/65/020/002/0053/0087

ACC NR: AP5028170

AUTHOR: Timan, A. F. 44,55

29
B

ORG: none

TITLE: Deformation of metric spaces and certain questions in function theory connected therewith 16,44,55

SOURCE: Uspekhi matematicheskikh nauk, v. 20, no. 2, 1965, 53-87

TOPIC TAGS: function theory, mathematic space, topology, mathematic physics, class theory, thermodynamics

Abstract: A number of extremum problems in function theory are variant formulations of a single common question relating to the theory of metric spaces. The basic concept underlying the formulation of the question is deformation of a metric space (i. e., change to some other metric). When the properties of functions studied over a space are determined by its metric, deformation of the metric space results in a change of such classes of functions as are characterized by these properties. This article is devoted to one such typical problem and contains a detailed exposition of the fundamental result as well as certain concrete examples of its application to various problems of analysis. The article states the problem as follows: Let Q be an arbitrary, regular topological

UDC: 517.5

Card 1/5

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ACC NR: AP5028170

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space with a countable base and M(Q), a Banach space of all real functions f(x) defined in points x(-Q, for which $\|f\| = \sup_{x \in Q} |f(x)| < \infty$.

According to Urysohn's theorem the space Q is metrizable and the possible metrization of Q which preserves the topology of the space is not unique. The corresponding metric space generated by the introduction of a certain metric $\rho(x, y)$ in Q is designated Q_ρ, and the class of functions f(x) in M(Q) which satisfy Hölder's condition

$$|f(x) - f(y)| \leqslant \rho(x, y) \qquad (1)$$

for any pair of points x and y in Q is designated $H(Q_\rho)$. The transition in Q from the given metric $\rho(x,y)$ to any other metric r (x, y), resulting in a new topology in Q, involves a change in the class, here considered, of functions f(x)(-M(Q) which satisfy condition (1). Arising in connection with this is the question of the metric characteristic of such a change — a problem which is connected with the study of the value of the reciprocal deviation of the classes $H(Q_r)$ and $H(Q_\rho)$, corresponding to two different metrics in Q: i. e., the value

$$E_{H(Q)_\rho}(H(Q_r)) = \sup_{f \in H(Q_r)} \inf_{g \in H(Q_\rho)} \|f - g\|. \qquad (2)$$

Card 2/5

L 3961-66

ACC NR: AP5028170

O

An example of the foregoing is the physics problem of the deformation of a body in a given temperature state with a limited heat flow, involving the selection of another temperature state which does not increase the maximum heat flow but in which the maximum temperature change will be a minimum at corresponding points. A determination is made of the maximum value of the corresponding optimum change in the temperature of the body.

Section 1 formulates the following fundamental theorem: For any two metrics $r(x, y)$ and $\rho(x, y)$, defined in a regular topological space Q with a countable base and preserving its topology, the equality

$$E_{H(Q_\rho)}(H(Q_r)) = \frac{1}{2} \sup_{x, y \in Q} (r(x, y) - \rho(x, y)), \qquad (3)$$

in which the right-hand side may be both finite and infinite holds true.

In Section 2 the fundamental theorem is initially established for the case in which the space Q consists of a finite number of elements. Since in this case $H(Q_\rho)$ and $H(Q_r)$ are certain polyhedrons of a finite-dimensional real space, the left-hand side of (3), representing the value of their deviation, can be calculated as the maximum of the distances between corresponding parallel bounds. Of fundamental importance here is the role played by the

L 3961-66

ACC NR: AP5028170

triangular property of each of the metrics. This property, as well as the result obtained in Section 2, is used in Section 4, in which the fundamental theorem is proved and generalized. The proof indicates that the scope of the theorem's applicability is really somewhat wider than is indicated in the formulation. It is shown in particular that equality (3) also remains valid for quasi-metrics: i. e., for metrics satisfying only the conditions $\varrho(x, x) = 0$ and $\varrho(x, y) \leqslant \varrho(x, z) + \varrho(y, z)$ (for metric spaces which may have "wrinkles"). This circumstance makes it possible to obtain equality (3) for the upper bound of (2) as well as the value of the optimum uniform approximation

$$\inf_{g \in H(Q_\rho)} \|f-g\| \qquad (4)$$

of any individual real function $f(x)$, continuous on Q; it is also important in the solution of a number of problems of the type here under consideration.

Section 5 presents a general theorem on the reciprocal deviation of classes, defined on an arbitrary compactum, of real continuous functions with given majorants of the modulus of continuity. Section 6 considers the application of the fundamental theorem to the problem of the optimum approximation of function superpositions.

Card 4/5

L 3961-66
ACC NR: AP5028170

Section 7 formulates a theorem on the optimum uniform approximation of individual functions. Section 9 deals with a structural characteristic of some classes of continuous functions given on a separable metric space. Section 10 deals with the question of the deviation of quasi-smooth functions from a class of functions with a bounded derivative. Orig. art. has 89 formulas. [JPRS]

SUB CODE: MA, TD / SUBM DATE: 01Feb64 / ORIG REF: 011

Card 5/5 DP

TIMAN, A.F.

Deformation of metric spaces and some associated problems in the theory of functions. Usp. mat. nauk 20 no.2:53-87 Mr-Ap '65. (MIRA 18:5)

TIMAN, A.F.

A problem in approximation theory bearing on the superposition of functions. Dokl. AN SSSR 154 no.2:274-275 Ja'64. (MIRA 17:2)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut im. F.E. Dzerzhinskogo. Predstavleno akademikom S.N. Bernshteynom.

ACCESSION NR: AP4012076 S/0020/64/154/002/0274/0275

AUTHOR: Timan, A. F.

TITLE: One problem of the theory of approximation relating to superpositions of functions

SOURCE: AN SSSR. Doklady*, v. 154, no. 2, 1964, 274-275

TOPIC TAGS: approximation theory, function superposition, mathematical analysis, mathematical function, Fourier series, Hoelder condition, topology

ABSTRACT: Let G be a regular topological space with a counting base, u = A(x) be a single-valued continuous operator mapping G onto some matric space Q_ρ with a metric $\rho(u,v)$, and let $H(Q_\rho)$ be a class of bounded real functions satisfying the Hölder condition

$$|f(u)-f(v)|\leqslant\rho(u,v). \quad (1)$$

in Q_ρ. Every operator u = A(x) brings into agreement all the functions $f \in H(Q_\rho)$ generated by the superpositions $f[A(x)]$ which are defined real functions F (x) = $f[A(x)]$ in G. The author shows some concrete results with respect to this problem for a case

Card 1/2

ACCESSION NR: AP4012076

when $A(x) = \lambda(x)$ and $B(x) = \mu(x)$ are continuous functionals defined in G and mapping this space onto the entire complex plane and onto some part of it. Three theorems are proved. The proof of these theorems is associated with a study of a change in the class of functions defined in a separable metric space and satisfying the Holder condition there during transition from a given metric $\rho(x,y)$ to some other metric $r(x,y)$. Orig. art. has: 4 equations.

ASSOCIATION: Dnepropetrovskiy khimiko-tekhnologicheskiy institut im. F.E. Dzerzhinskogo (Dnepropetrovsk Chemical Engineering Institute)

SUBMITTED: 30Apr63 DATE ACQ: 14Feb64 ENCL: 00

SUB CODE: MM NR REF SOV: 003 OTHER: 000

TIMAN, A.F.

P.S.Uryson's metrization theorem. Dokl. AN SSSR 150 no.1:52-53
My '63. (MIRA 16:6)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut im.
Dzerzhinskogo. Predstavleno akademikom A.N.Kolmogorovym.
(Topology)

L 16981-63 EWT(d)/FCC(w)/BDS AFFTC/IJP(C)
S/020/63/149/005/003/018

52

AUTHOR: Timan, A. F.

TITLE: On a constructive principle of duality in the class of continous functions, monotonically decreasing to zero and convex on the half line

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 149, no. 5, 1963, 1041-1042

TEXT: Let $\omega(t)$ be a module of continuity defined for $0 \leqslant t \leqslant \infty$, i.e. a continous, non-decreasing function, such that $\omega(0) = 0$. For every non-negative value M consider a class MH_ω of all functions g satisfying condition

$$|g(x_1) - g(x_2)| \leqslant M\omega(|x_1 - x_2|). \qquad (1)$$

Denote by $E_M^\omega(f)$ the best uniform approximation of the function $f(x)$ by $g(x)$, which satisfies (1) i.e. $E_M^\omega(f) = \inf_{g \in MH_\omega} \sup_{0 \leqslant x < \infty} |f(x) - g(x)|$. (2)

The author proves the following theorem: For every convex from above and unbounded on $[0, \infty)$ module of continuity $\omega(t)$ the class of all continous, monotonically decreasing functions $f(x)$, defined for $0 \leqslant x < \infty$ is identical with the class of their best approximations $E(M) = E_M^\omega(f)$.

SUBMITTED: October 29, 1962

Card 1/1

TIMAN, A.F.

A constructive duality principle in a class of continuous functions which decreases monotonically to zero and are convex on the half-axis. Dokl. AN SSSR 149 no.5:1041-1042 Ap '63. (MIRA 16:5)

1. Predstavleno akademikom S.N.Bernshteynom.
(Functions, Continuous)

TIMAN, A.F.

A constructive duality principle in a class of continuous functions which decreases monotonically to zero and are convex on the half-axis. Dokl. AN SSSR 149 no.5:1041-1042 Ap '63. (MIRA 16:5)

1. Predstavleno akademikom S.N.Bernshteynom.
(Functions, Continuous)

TIMAN, A.F.

A constructive characteristic of certain classes of continuous functions given in a separable metric space. Dokl. AN SSSR 150 no.2:266-267 My '63. (MIRA 16:5)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut im. F.E.Dzerzhinskogo. Predstavleno akademikom S.N.Bernshteynom. (Functions, Continuous) (Topology)

TIMAN, A. F.

"On some new questions in the theory of approximation of functions of a real variable"

report submitted at the Intl Conf of Mathematics, Stockholm, Sweden, 15-22 Aug 62

TIMAN, A.F.

One geometrical problem in the theory of approximations. Dokl. AN SSSR 140 no.2:307-310 S '61. (MIRA 14:9)

1. Dnepropetrovskiy gosudarstvennyy universitet im. 300-letiya vossoyedineniya Ukrainy s Rossiyey. Predstavleno akademikom A.N. Kolmogorovym.

(Approximate computation)

VLASOV, V.F.; TIMAN, A.F.

Relation for integrals of moduli of trigonometric polynomials. Dokl. AN SSSR 138 no.6:1263-1265 Je '61. (MIRA 14:6)

1. Predstavleno akademikom S.N.Bernshteynom.
(Polynomials) (Integrals)

28661

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S/020/61/140/002/006/023
C111/C444

AUTHOR: Timan, A. F.

TITLE: On a geometric problem in the theory of approximation

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 2, 1961, 307-310

TEXT: Let R be a metric space, G an arbitrary set in R, F a bounded set,

$$\mathcal{E}_G(F) = \sup_{f \in F} \inf_{g \in G} \rho(f,g) \qquad (1)$$

H_ω denotes the set of all real continuous functions f(t), satisfying the condition $|f(t) - f(\tau)| \leq \omega(|t-\tau|)$ for arbitrary t and τ on $[a,b]$, where $\omega(n)$ is the modulus of continuity.

Theorem 1: For arbitrary continuity moduli $\omega_1(u)$ and $\omega_2(u)$ is the space C of the continuous functions on $[a,b]$ there always holds

$$\mathcal{E}^C_{H_{\omega_2}}(H_{\omega_1}) = 1/2 \max_{0 \leq u \leq b-a} \{\omega_1(u) - \omega_2(u)\} \qquad (7).$$

Card 1/4

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On a geometric problem in the theory ... C111/C444

If one considers the space C^* of all continuous 2π- periodic functions and the corresponding classes $H^*_{\omega_1}$ and $H^*_{\omega_2}$, then in C^* for arbitrary $\omega_1(u)$ and $\omega_2(u)$ it holds

$$\mathcal{E}^{C^*}_{H^*_{\omega_2}}(H^*_{\omega_1}) = 1/2 \max_{0 \leq u \leq \pi} \{\omega_1(u) - \omega_2(u)\} \qquad (8)$$

X

Theorem 3: Let Z_1 be the class of all functions $f(t)$ given on $[-1,1]$ which satisfy the conditions $f(+1) = f(-1) = 0$, $|f(t_1) - f(t_2)| \leq 1$

$\left|f(t_1) - 2f\left(\frac{t_1+t_2}{2}\right) + f(t_2)\right| \leq |t_1 - t_2|$, $t_1, t_2 \in [-1,1]$. Then in the space C of all continuous functions on $[-1,1]$ for $\omega(u) = mu$ (m-integer) the following relation holds

$$\mathcal{E}^{C}_{H_\omega}(Z_1) = \frac{1}{2^{m+1}}.$$

Card 2/4

28661
S/020/61/140/002/006/023
On a geometric problem in the theory ... C111/C444

As applications are mentioned:

Theorem 4: For an arbitrary convex continuity modulus $\omega_1(u)$ it holds

$$\sup_{f \in H^*_{\omega_1}} \overline{\lim_{n \to \infty}} \frac{E^*_{n-1}(f)}{\omega_1\left(\frac{\pi}{n}\right)} = \frac{1}{2} \qquad (11)$$

where

$$E^*_{n-1}(f) = \inf_{a_k, b_k} \max_t \left| f(t) - \sum_{k=0}^{n-1} (a_k \cos kt + b_k \sin kt) \right| .$$

Theorem 5: If $\omega_1(u)$ is an arbitrary convex continuity modulus and $D_{2n-1}(H^*_{\omega_1})$ the diameter of the order 2n-1 (compare with A. N. Kolmogorov (Ref. 3: Ann. of Math., 37, 107 (1936); V. M. Tikhomirov (Ref.8: DAN, 130, no. 4, 734 (1960) UMN, no. 3 (1960))) for $H^*_{\omega_1}$ then

$$D_{2n-1}(H^*_{\omega_1}) = \frac{1}{2} \omega_1 \left(\frac{\pi}{n}\right) \qquad (12).$$

Card 3/4

28661
S/020/61/140/002/006/023
On a geometric problem in the theory ... C111/C444

This theorem completes a result of Lorenz (Ref.4: G.G. Lorenz, Bull. Am. Math. Soc, 66, no. 2, 124 (1960)).

The author mentions M. G. Kreyn, N. J. Akhiyezer, P.L. Chebyshev, N.P. Korneychuk, S.M. Nikol'skiy.

The author reported on the contents of this paper at a seminary on function theory at the University of Dnepropetrovsk, on March 28, 1961.

There are 6 Soviet-bloc and 3 non-Soviet-bloc references. The two reference to English language publications read as follows: A.N. Kolmogorov, Ann. of Math., 37, 107 (1936); G. G. Lorenz, Bull. Am. Math. Soc., 66, no. 2, 124 (1960)

ASSOCIATION: Dnepropetrovskiy gosudarstvennyy universitet imeni 300-letiya vossoyedineniya Ukrainy s Rossiyey (Dnepropetrovsk State University imeni 300-Years Reunion of the Ukraine with Russia)

PRESENTED: April 27, 1961, by A. N. Kolmogorov, Academician

SUBMITTED: April 27, 1961

Card 4/4

TIMAN, A.F.

Simultaneous approximation of functions and their derivatives on the entire numerical axis. Izv.AN SSSR Ser.mat. 24 no.3:421-430 My-Je '60. (MIRA 14:4)

1. Predstavleno akademikom S.N.Bernshteynom.
(Approximate computation)

16.2600

S/041/60/012/001/006/007
C111/C222

AUTHOR: Timan, M.F.

TITLE: Remark on the Question of Transformations of Multiple Sequences

PERIODICAL: Ukrainskiy matematicheskiy zhurnal, 1960, Vol. 12, No. 1, pp 99 - 100

TEXT: Let $\mathfrak{M}(b_m, c_m)$ be the class of double sequences $\{s_{m,n}\}$ for which

(1) $s_{m,n} = O(b_m)$ for every fixed n

(2) $s_{m,n} = O(c_n)$ for every fixed m

(3) $|s_{m,n}| \leqslant M$ for $m,n \geqslant N$

where $\{b_m\}$, $\{c_n\}$ are positive number sequences, $\lim\limits_{m\to\infty} b_m = \infty$, $\lim\limits_{n\to\infty} c_n = \infty$.

If N = 0 then $\mathfrak{M}$ is denoted by $\mathfrak{M}_0$. Let

Card 1/5

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C111/C222

Remark on the Question of Transformations of Multiple Sequences

(4) $$\sigma_{m,n} = \sum_{k=0}^{\infty} \sum_{l=0}^{\infty} a_{k,l,m,n} S_{k,l}$$

Let $(m,n)_{r,\varrho,\mu} \to \infty$ mean that m and n, for a fixed $\mu \geqslant 1$, tending to infinity satisfy

(12) $$\frac{n^r}{\mu} \leqslant m \leqslant \mu n^{\varrho} \quad (r \leqslant \varrho) \quad .$$

Theorem 1 : If the system of numbers $\{a_{k,l,m,n}\}$ for arbitrary fixed $\lambda \geqslant 1$, $\mu \geqslant 1$ satisfies the conditions

(5) $$\lim_{(m,n)_{r,\varrho,\mu} \to \infty} a_{k,l,m,n} = 0 \quad \text{for arbitrary fixed } k,l$$

(6) $$\sum_{\frac{1}{\lambda} l^r < k < \lambda l^{\varrho}} |a_{k,l,m,n}| \leqslant M \quad \text{uniformly in } m,n \text{ which satisfy (12)}$$

Card 2/5

(7)
$$\lim_{\substack{(m,n)\to\infty \\ r,\varrho,\mu}} \sum_{k=0}^{\infty} \sum_{l=0}^{\infty} a_{k,l,m,n} = 1$$

(8)
$$\lim_{\substack{\lambda\to\infty \\ (m,n)_{r,\varrho,\mu}\to\infty}} \sum_{\lambda l^{\varrho} \leq k} |a_{k,l,m,n}| = 0$$

(9)
$$\lim_{\substack{\lambda\to\infty \\ (m,n)_{r,\varrho,\mu}\to\infty}} \sum_{\lambda k \leq l^{r}} |a_{k,l,m,n}| = 0$$

then from $s_{m,n} \in \mathfrak{M}_0$ and from the fact that for every fixed $\lambda \geqslant 1$ it holds

(10)
$$\lim_{(m,n)_{r,\varrho,\lambda}\to\infty} s_{m,n} = s$$

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C111/C222

it follows that also

(11) $$\lim_{(m,n)_{r,\varsigma,\mu}\to\infty} \sigma_{m,n} = S$$

is valid.

Theorem 2 : If the system of numbers $\{a_{k,l,m,n}\}$ for arbitrary fixed $\lambda \geqslant 1$, $\mu \geqslant 1$, beside of (5), (6), (7), (8), (9) still satisfies

(13) $$\sum_{k=o}^{N} \sum_{l=N+1}^{\infty} |a_{k,l,m,n}| c_l \leq M$$

and

(14) $$\sum_{k=N+1}^{\infty} \sum_{l=o}^{N} |a_{k,l,m,n}| b_k \leq M$$

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Remark on the Question of Transformations of Multiple Sequences

for arbitrary fixed N and $\mu \geqslant 1$ which satisfy (12) uniformly in m and n then from $S_{m,n} \in \mathfrak{M}(b_m, c_n)$ and (10) there follows the relation (11).

There are 4 references : 3 Soviet and 1 American.

[Abstracter's note : There is a misprint in formula (6)].

SUBMITTED: January 28, 1959

Card 5/5

67084

SOV/44-59-1-288

~~16(1)~~ 16.2600

Translation from : Referativnyy zhurnal.Matematika,1959,Nr 1,p 54 (USSR)

AUTHOR: Timan, A.F.

TITLE: On an Inequality

PERIODICAL: Nauchn.zap. Dnepropetr. un-t, 1956,45,221-224

ABSTRACT: Let A_p^1 denote the class of the functions $f(x)$ which satisfy the following conditions : 1.) $f(x)$ is a real, analytic function on the real axis 2.) there exists a point x_o and a number $p>0$ so that for every natural k it holds

$$|f^{(2k+1)}(x_o)| \leq p^{2k} |f'(x_o)|$$

3.) the preceding inequality can become an equality only simultaneously for all $k>0$, and in this case it is

$$f^{(2k+1)}(x_o) = (-1)^k p^{2k} f'(x_o) .$$

Theorem I : For every function $f(x) \in A_p^1$ there exists a $\delta > 0$ so that for $0<h<\delta$ in the point x_o the inequality

Card 1/3

67084

SOV/44-59-1-288

16(1)
On an Inequality

(1) $$|f'(x_0)| \leqslant \frac{p}{2 \sin p h} |f(x_0 + h) - f(x_0 - h)|$$

is satisfied. For sufficiently small h it is

(2) $$\sup |f'(x)| \leqslant \frac{p}{2 \sin p h} \sup_{-\infty < x < \infty} |f(x + h) - f(x - h)| .$$

The inequalities (1) and (2) generalize the inequalities of S.B.Stechkin (Doklady AN SSSR, 1948,60) on trigonometric polynomials and inequalities of S.M. Nikol'skiy (Doklady AN SSSR,1948,60) and S.N. Bernshteyn (Doklady AN SSSR, 1948,60 ; Collected Works, Vol II, article Nr 95) on entire functions of finite degree.

Theorem II : If f(x) satisfies the conditions 1.) and 2.), then in the point x_0 for sufficiently small $h > 0$ there holds the inequality

$$|f'(x_0)| \geqslant \frac{p}{2 \operatorname{sh} p h} |f(x_0 + h) - f(x_0 - h)| .$$

Card 2/3

67084

16(1) SOV/44-59-1-288

On an Inequality

Besides the mentioned class of functions A_p' the author introduces other classes of functions for which analogous questions are considered.

V.S. Videnskiy

Card 3/3

16(1)
AUTHORS: Brudnyy, Yu.A., Timan, A.F. SOV/20-126-5-3/69

TITLE: Constructional Characteristics of Compact Sets in Banach Spaces and ε - Entropy

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 5, pp 927-930 (USSR)

ABSTRACT: Let F be an infinite-dimensional separable Banach space; $X\{x_k\}$ be a linear independent system closed in F. There always exist elements x, for which the best approximations $E^X(x) = \inf_{c_k} \left\| x - \sum_{k=0}^{n} c_k x_k \right\|$ tend arbitrarily slowly to zero, so that $\sup_{x \in W} E_n^X(x)$, where W is a bounded set in F, does not need tend to zero. If, however, this is the case, then W consists of elements for which the approximation velocity of the best approximations to zero possesses a common characteristic $\varepsilon_n^X(W) = \sup_{x \in W} E_n^X(x)$. Let $\varepsilon = \Phi_W(\eta)$ be

Card 1/2

the inverse function of the ε - entropy of W. Theorem :

$\mathcal{E}^{X}_{n-1}(W) \leqslant 4\,\Phi_{W_X}(n+1)$, where W_X is a set consisting of all

$x \in F$ for which it is $\|x\| \leqslant \mathcal{E}^{X}_{o}(W)$; $E^{X}_{k}(x) \leqslant \mathcal{E}^{X}_{k}(W)$.

Seven further similar theorems for special W-classes are given. The author mentions A.G. Vitushkin, A.N. Kolmogorov, S.N. Bernshteyn.
There are 10 references, 6 of which are Soviet, 3 American, and 1 French.

ASSOCIATION: Dnepropetrovskiy gosudarstvennyy universitet imeni 300-letiya vossoyedineniya Ukrainy s Rossiyey (Dnepropetrovsk State University imeni 300-letiya vassoyedineniya Ukraïhy s Rossiyey)

PRESENTED: March 4,1959, by A.N. Kolmogorov, Academician
SUBMITTED: March 2, 1959

Card 2/2

16(1)

SOV/42-14-3-6/22

AUTHORS: Ganzburg, I.M., Timan, A.F.

TITLE: On Riemannian Sums for the Integrals of the Absolute Values of Some Trigonometric Polynomials

PERIODICAL: Uspekhi matematicheskikh nauk, 1959, Vol 14, Nr 3, pp 123-128 (USSR)

ABSTRACT: Let

$$K_n(t) = \frac{\lambda_o^{(n)}}{2} + \sum_{k=1}^{n} \lambda_k^{(n)} \cos kt$$ be a sequence of trigonometric polynomials, the coefficients of which form a convex or concave numerical system, and which satisfy the condition $\left|\lambda_k^{(n)}\right| \leqslant A + B\left|\lambda_o^{(n)}\right|$, $k = 1,2,\dots,n$ with positive constants A and B. The authors consider the sums

$$\sigma_n^r(x, \lambda) = \frac{2}{\pi r} \sum_{\nu=1}^{r} \left|K_n(x - t_\nu)\right| ,$$

Card 1/3

On Riemannian Sums for the Integrals of the Absolute Values of Some Trigonometric Polynomials SOV/42-14-3-6/22

where $t_\nu = \frac{2\nu\pi}{r}$, $\nu = 0,1,\dots,r$.

Theorem : If

$\frac{r}{2n+1}$ is an integer, then for $n \to \infty$ it holds

the asymptotic equation

$$\sigma_n^r(x,\lambda) = \frac{2(2n+1)}{r\pi} \operatorname{cosec} \frac{\pi(2n+1)}{2r} \left| \cos\left\{ \frac{(2n+1)\pi}{r}\left(\frac{1}{2} + \left[\frac{rx}{2\pi}\right] - \frac{rx}{2\pi}\right)\right\} \cdot \right.$$

$$\left. \cdot \sum_{k=0}^{n} \frac{\lambda_k^{(n)}}{n-k+1} \right| + O\left(A + B/\lambda_0^{(n)}|\right) ,$$

where $O(1)$ is a uniformly bounded magnitude with respect to

n, x and $\frac{r}{2n+1}$.

Card 2/3

On Riemannian Sums for the Integrals of the Absolute Values of Some Trigonometric Polynomials

SOV/42-14-3-6/22

There are 7 references, 6 of which are Soviet, and 1 American.

SUBMITTED: February 4, 1956

Card 3/3

GANZBURG, I.M.; TIMAN, A.F.

Linear processes in the approximation of functions, satisfying Lipshits' condition, by algebraic polynomials. Izv.AN SSSR. Ser.mat. 22 no.6:771-810 N-D '58. (MIRA 11:12)

1. Predstavleno akademikom S.L.Sobolevym.
(Functional analysis)

SOV/21-10-3-10/14

AUTHOR: Timan, A.F.

TITLE: On the Theorems of Jackson (O teoremakh Dzheksona)

PERIODICAL: Ukrainskiy matematicheskiy zhurnal, 1958, Vol 10, Nr 3, pp 334 - 336 (USSR)

ABSTRACT: The author shows : If it is

$$F(x) = \frac{1}{\pi} \int_{-\pi}^{\pi} f(t) D_{r,\delta}(x-t)\,dt \text{ , where } r>0 \text{ and}$$

$$D_{r,\delta}(t) = \sum_{k=1}^{\infty} \frac{\cos\left(kt - \frac{\delta\pi}{2}\right)}{k^r} \text{ , and if it holds } \|f\|_{L_p} < \infty$$

$(1 \leq p \leq \infty)$, then for $n \to \infty$ it holds

$$E_n^*(F)_{L_p} = 0\left[\frac{1}{n^r}\,\omega_k\left(f\,;\frac{1}{n}\right)_{L_p}\right]$$

Here E_n^* denotes the best approximation by trigonometric poly

Card 1/2

SOV/[illegible] 0/4

On the Theorems of Jackson

nomials of at most n-th order, and ω_k [illegible] modulus of continuity.

SUBMITTED: January 10, 1958 [illegible]

Card 2/2

16(1) SOV/38-22-6-3/6

AUTHORS: Ganzburg, I.M. and Timan, A.F.

TITLE: Linear Approximation Processes by Algebraic Polynomials for Functions Which Satisfy the Lipschitz Còndition (Lineynyye protsessy priblizheniya funktsiy, udovletvoryayushchikh usloviyu Lipshitsa, algebraicheskimi mnogochlenami)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya matematicheskaya, 1958, Vol 22, Nr 6, pp 771 - 810 (USSR)

ABSTRACT: The authors already announced great parts of the present paper a longer time ago (Timan [Ref 13], Ganzburg [Ref 2]). The investigation of the approximation by arithmetic means of the partial sums of the Chebyshev series seems to be new, as well as a generalization of the Chebyshev series and approximation by means of the partial sums of this generalized series. This last method is denoted as the "linear approximation process by algebraic polynomials". The paper consists of 6 paragraphs and contains 11 theorems with partially very extensive proofs.
There are 18 references, 15 of which are Soviet, 1 German, 1 Hungarian, and 1 Polish.

Card 1/2

Linear Approximation Processes by Algebraic Polynomials SOV/38-22-6-3/6
for Functions Which Satisfy the Lipschitz Condition

PRESENTED: by S.L. Sobolev, Academician

SUBMITTED: June 25, 1957

Card 2/2

SOV/38-22-3-3/9

AUTHOR: Timan, A.F.

TITLE: On the Best Approximation of Differentiable Functions by Algebraic Polynomials on a Finite Interval of the Real Axis (O nailuchshem priblizhenii differentsiruyemykh funktsiy algebraicheskimi mnogochlenami na konechnom otrezke veshchestvennoy osi)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya matematicheskaya, 1958, Vol 22, Nr 3, pp 355-360 (USSR)

ABSTRACT: Let $W^{(r)}(M)$ denote the class of the functions $f(x)$ defined on $[-1,1]$ which there possess a derivative $f^{(r)}(x)$ for which it is $|f^{(r)}(x)| \leqslant M$.

Theorem: For every $f(x) \in W^{(r)}(M)$ there exists a sequence of polynomials $P_n(f,x)$ with the property that

$$\overline{\lim_{n\to\infty}}\; n^r \left|f(x) - P_n(f,x)\right| \leqslant M \cdot K_r \left(\sqrt{1-x^2}\right)^r$$

Here it is

Card 1/2

On the Best Approximation of Differentiable Functions by Algebraic Polynomials on a Finite Interval of the Real Axis

SOV/38-22-3-3/9

$$K_r = \frac{4}{\pi} \sum_{\nu=0}^{\infty} \frac{(-1)^{\nu(r+1)}}{(2\nu+1)^{r+1}}$$

There are 11 references, 10 of which are Soviet, and 1 French.

PRESENTED: by M.A. Lavrent'yev, Academician

SUBMITTED: May 17, 1957

1. Functions--Theory 2. Approximate computation 3. Polynomials

Card 2/2

TIMAN, A.F.

Jackson's theorems. Ukr. mat. zhur. 10 no.3:334-336 '58. (MIRA 11:11)
(Functions, Periodic)

TIMAN, A.F.

Best approximation of differentiable functions by algebraic polynomials on a finite section of the real axis. Izv. AN SSSR. Ser. mat. 22 no.3:355-360 My-Je '58. (MIRA 11:8)

1. Predstavleno akademikom M.A. Lavrent'yevym.
(Functions of real variables) (Polynomials)